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1883

HEALTHY DIGESTION.

A POPULAR TREATISE ON

INDIGESTION, DYSPEPSIA

AND

BILIOUSNESS.

BY

J. CRESAP M^cCOY, M. D.

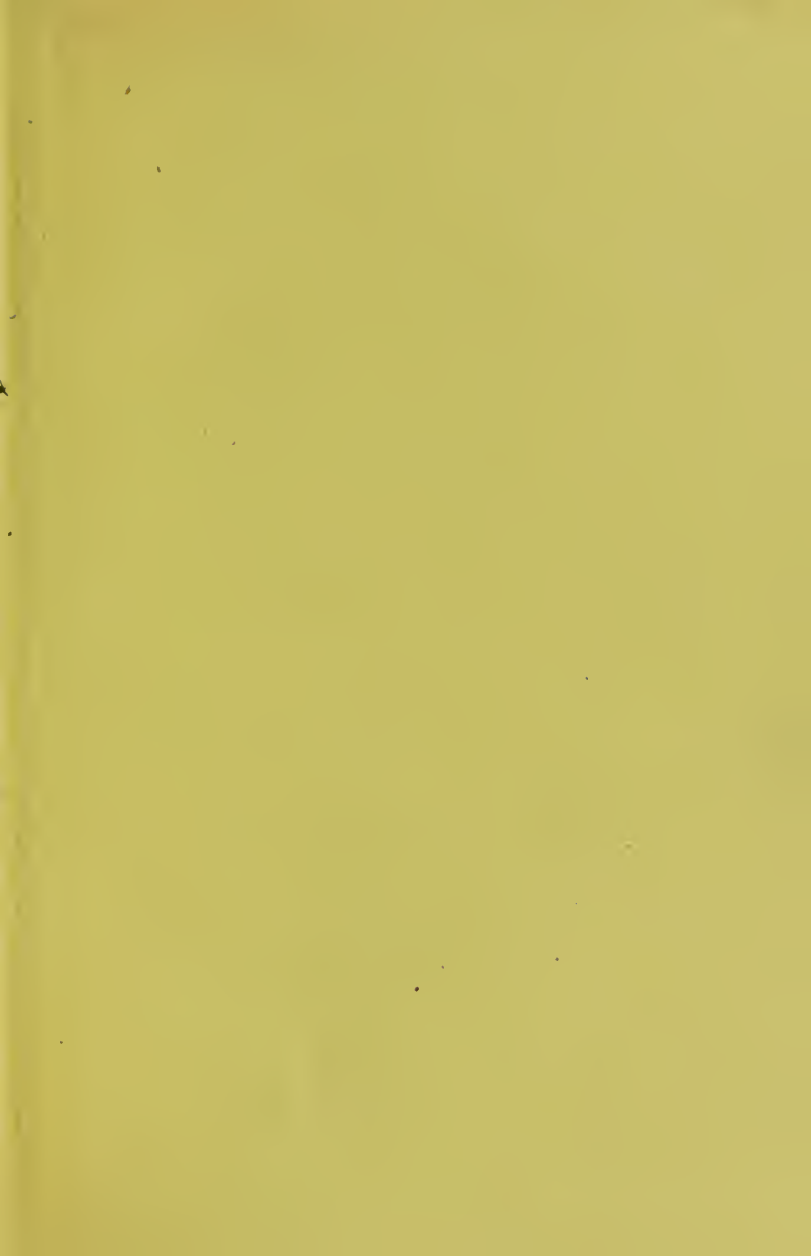


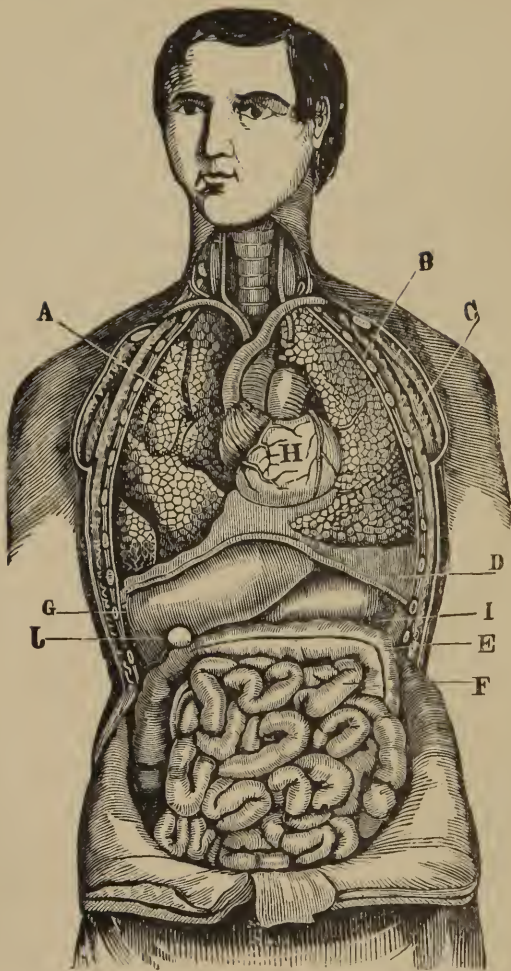
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GENERAL ARRANGEMENT OF THE ORGANS
OF THE BODY.

A B the lungs, and H the heart, divided from the cavity of the abdomen by D the diaphragm, C the liver, J the gall bladder, I the stomach partly covered by the liver, E the large intestine, F the small intestine.

HEALTHY DIGESTION.

A POPULAR TREATISE

ON

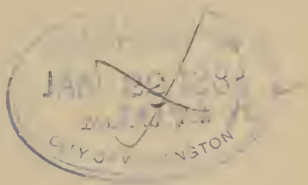
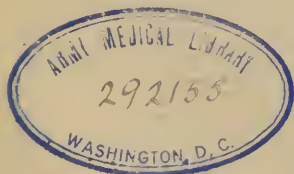
INDIGESTION, DYSPEPSIA, AND BILIOUSNESS.

BEING THE SUBSTANCE OF A COURSE OF LECTURES ON THE
PHYSIOLOGY OF DIGESTION, DELIVERED BEFORE
POPULAR AUDIENCES IN THE CITY OF HAR-
RISBURG, DURING THE MONTH
OF SEPTEMBER, 1882.

BY

J. CRESAP MCCOY, M. D.,

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Bellevue Hospital, New York. Late Physician to
the training-school, for nurses, Bellevue
Hospital, &c.*



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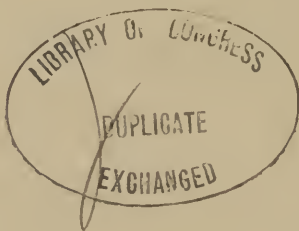
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“The accursed hag, dyspepsia, had got me bitted and bridled, and was ever striving to make my living, waking day, a thing of ghastly nightmares.”—*Carlyle*.

“How small the part that laws can cause or cure
Of all the ills that human hearts endure.”

“Live while you live, the epicure would say,
And seize the pleasures of the present day.”
—*Doddridge*.

“What is one man’s meat is another man’s poison.”



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by
J. CRESAP MCCOY, M. D.

To
Hon. GEORGE A. McDERMOTT,
New York City,
IN COMMEMORATION OF HIS GREAT ABILITIES, AND UN-
DAUNTED PERSEVERANCE; AND IN PLEASANT REMEM-
BRANCE OF THE FRIENDSHIP WHICH HAS EVER
EXISTED BETWEEN US, THIS LITTLE
WORK IS INSCRIBED
by
THE AUTHOR.



P R E F A C E.

The study of chronic disease has compelled the writer to pay most careful attention to the subject of nutrition and its disturbances.

Study in the dead-house, even when aided by the microscope, can never teach us the facts concerning disease of the digestive processes. It is necessary that we should be instructed as regards the functions or actions of the various organs engaged in the process of digestion. We must also study the disturbances of these functions. Physiology, a study of the functions of the organs in health, alone can guide us to a knowledge of disordered function.

The following little book is written from a purely physiological standpoint.

The history of normal digestion precedes and introduces the subject of indigestion ; first, in the alimentary canal ; then, secondly, in the liver. By such a study the management of indigestion, in its various forms, becomes intelligible.

The disturbances of the digestive processes are terribly on the increase in the present day ; and a chapter is appended on "The failure of the digestive organs at the present day."

In placing this book before the public, the author does not claim originality for the matter contained in its pages. The thoughts and facts which gave rise

to the work were derived from reading the classic works of the late Claude Bernard, the great French physiologist, and the observations of Michael Foster, the greatest of English physiologists. Besides this, he received many practical suggestions from Roberts, of Manchester, England, and from Fothergill, of London.

What he claims is simply this: That this is the first correct work on the subject of indigestion that has been presented to the masses; that the matters contained in the following chapters are absolute facts, and that the subject of the normal digestion was not understood until a few years past.

The most recent investigations, by the greatest of living experimentalists, are contained in the following chapters, the matter having been first divested of its technicalities and arranged so that the popular mind may grasp the ideas.

28 SOUTH SECOND STREET,
HARRISBURG,
Dec. 5th, 1882.

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INTRODUCTION.

As an introduction to the following pages, let it suffice to say that I start out by claiming the following broad assertions to be facts :

First. The subject of digestion is the least understood of all the processes of the body, and until the last decade, what was written on this subject was only theory.

Second. That over one half of all the ills to which the human flesh is heir, are produced by failure in the digestive processes, and that two thirds of these ills are induced by eating too much albumen, in the form of animal food.

Third. That for every child now dying from acute disease, a thousand may be found in their graves from failure of their digestive organs.

Fourth. That all forms of chronic disease are brought about by failure in the digestive function. This failure may be due to improper food, bad surroundings, or inheritance.

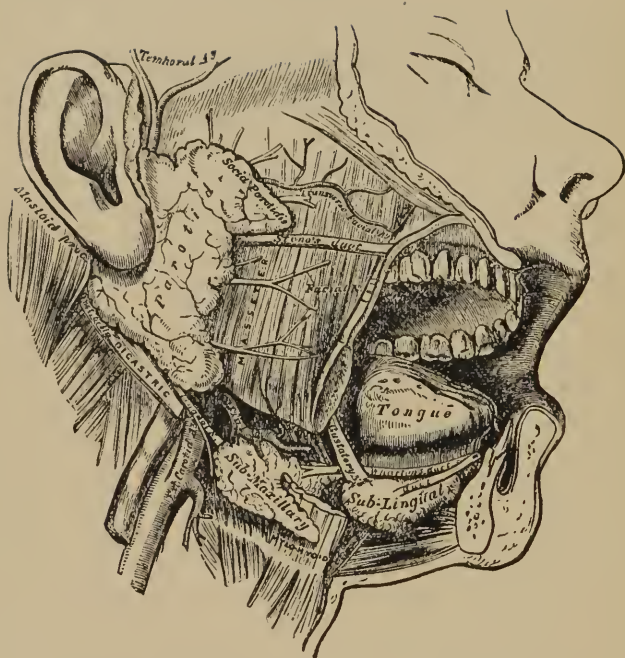
Fifth. That the person suffering from any form of digestive failure, is liable to transmit to his or her offspring not digestive troubles alone, but consumption, cancer, scrofula, &c.

Sixth. That deterioration in any part of the economy, means failure of the digestive processes. It makes

no difference whether this be gray or bald heads, decay of teeth, defective sight, rheumatism, or gout.

Seventh. That in order to improve our race and insure a healthy offspring, we must understand these processes and put our knowledge into practice.

How far I may be able to prove these assertions, and impress you with their importance, can be judged by a careful perusal of the following chapters.



CUT SHOWING THE DISSECTION OF SALIVARY GLANDS WITH
THEIR DUCTS OPENING INTO THE MOUTH.—(Gray.)

CHAPTER I.

THE DIGESTIVE ORGANS.

The digestive process or digestion is carried on in certain structures and organs which, taken together, have been styled the alimentary canal. This canal begins at the lips and ends with the last portion of the great intestine, and is composed of mouth, pharynx, œsophagus or gullet, stomach, small and large intestines.

The mouth is bounded in front by the lips, laterally by the cheeks, posteriorly by the soft palate and opening to the gullet, and above by the roof of the mouth or hard palate. It contains the tongue, teeth, and openings for the ducts of various salivary glands. These glands consist of three pairs, namely: Two parotid, two submaxillary, and two sublingual. The parotid glands are situated in the cheek just below the ear, and open into the mouth at a point opposite the crown of the second molar tooth of the upper jaw. The submaxillary glands are situated just below and on the inside of the body of the jaw, one on either side, and open into the mouth by a duct situated just below the tip of the tongue, known as Wharton's duct. The sublingual glands, as their name implies, are situated below the tongue, and open into the mouth at this point by several ducts known as the ducts of Bartholine.

These glands taken together manufacture the saliva. They produce, in the course of each twenty-four hours,

about 4 pounds of a watery-looking fluid, with a specific gravity of 1005, and of an *alkaline* reaction.

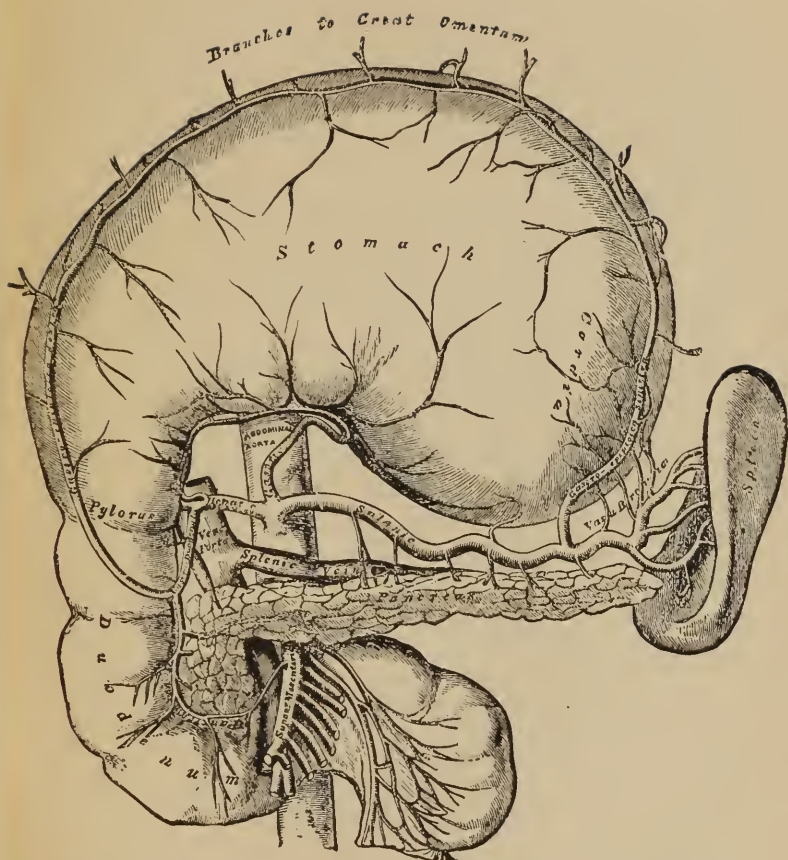
When the food is thoroughly chewed and mixed with this alkaline fluid, it is then passed back by the tongue to pharynx, when the constrictor muscles of this part grasp it and by contraction squeeze it down through the gullet to the stomach.

This last-named organ is the most dilated portion of the alimentary canal, and will contain in the adult, about 5 pints.

Situated in the mucus membrane lining the stomach are numerous glands, one set of which are called mucus glands, from the fact that their function is the secretion of mucus; and secondly, the gastric or peptic glands, whose function it is to secrete the gastric or stomach juice. These little structures pour out daily about 14 pounds of this last-named fluid, which is highly *acid* in reaction, having a specific gravity of about 1010. When the food is thoroughly mixed with the gastric juice, which is in reality simply a solvent of certain elements of the food, it gradually passes out through the pylorus or gateway of the stomach, and thence into the small intestine.

And now the digestive act has reached its height. The small intestine is a tube about 22 feet in length, all along which are scattered numerous little glands called intestinal glands, the action of which is to secrete the intestinal juice. This they manufacture to the extent of about $2\frac{1}{2}$ gallons daily.

At the upper portion of the small intestine there



CUT SHOWING THE STOMACH LIFTED UP, DISCLOSING THE PANCREAS AND SPLEEN, AND THE RELATION OF THESE ORGANS TO ONE ANOTHER, TOGETHER WITH THEIR BLOOD-VESSEL SUPPLY.—(Gray.)

is an opening, and in some instances two openings, one for the gall duct of the liver, the other for the duct from the pancreas, or sweet-bread. Usually, however, these ducts unite and pour their contents through a single opening.

The gall duct conveys the bile manufactured by the liver. The pancreatic duct conveys the secretion of the pancreas.

Both these juices combine with the juices of the intestinal glands to carry on the digestive act in the intestine, and taken together their reaction is decidedly *alkaline*.

The mucus lining of the small intestine is studded all over with little hair-like processes, the villi or absorbents. These number about ten millions. Their function is to take up the digested food and convey the starches and albumen to the liver, while the fat is sent to the thoracic duct, or great lymph carrier of the body.

The large intestine, measuring about 6 feet in length, is continuous with the small intestine, and simply serves as a channel through which waste matters may be conveyed from the system.

Bear in mind the following facts, and we are ready to go on with our subject :

The digestive act is carried on by the means of solvents. These solvents are the various digestive juices, or fluids.

The first is the saliva poured out in the mouth, and is alkaline in reaction.

CHAPTER II.

NORMAL DIGESTION.

FROM THE FOOD THE BLOOD IS FED. FROM THE BLOOD
THE TISSUES ARE FED.

Before going further, it would be well to take a bird's-eye view of the natural digestive process. Our knowledge of this subject is quite recent, consequently medical teaching, until the last few years, has had but little to say on the matter.

*The digestive act is carried on by the means of *ferments*.

A *ferment* is a body which works changes in other substances, altering their chemical constitution. Thus yeast is a ferment used in making bread. In the *saliva* we have a ferment; in the *gastric juice* another ferment; and in the *pancreatic juice* a third, the most complete of all.

* TABLE OF THE DIGESTIVE JUICES AND THEIR FERMENTS.

[From Roberts on the digestive ferments.]

	DIGESTIVE JUICES.	FERMENTS CONTAINED IN THEM.	THEIR ACTION ON FOOD MATERIALS.
Mouth	Saliva,	Ptyalin,	{ Changes Starch into sugar and dextrine.
Stomach.	Gastric Juice,	a. Pepsin, b. Curdling Ferment,	{ Changes Albumen into soluble albumen or peptones, in an acid medium. Curdles the casein of milk.
Intestine.	Pancreatic Juice,	a. Trypsin, b. Curdling Ferment, c. Pancreatic Diastase, d. Emulsive Ferment,	{ Changes Albumen into peptones in an alkaline medium. Curdles the casein of milk. Changes starch into sugar. Emulsifies and partially saponifies fats.
	Bile,	?	Assists in emulsifying fats.
	Intestinal Juice,	a. Invertin, b. Curdling Ferment,	{ Changes cane-sugar into invert-sugar. Curdles the casein of milk.

An examination of the table shows that a long and complicated series of ferment-actions are required to accomplish the digestion of our food. Starch is attacked at two points—in the mouth and in the small intestine—by two ferments, salivary and pancreatic diastase, which are almost identical. Albumen is also attacked at two points—in the stomach and in the small intestine, but here the two ferments, pepsin and trypsin, are not identical.

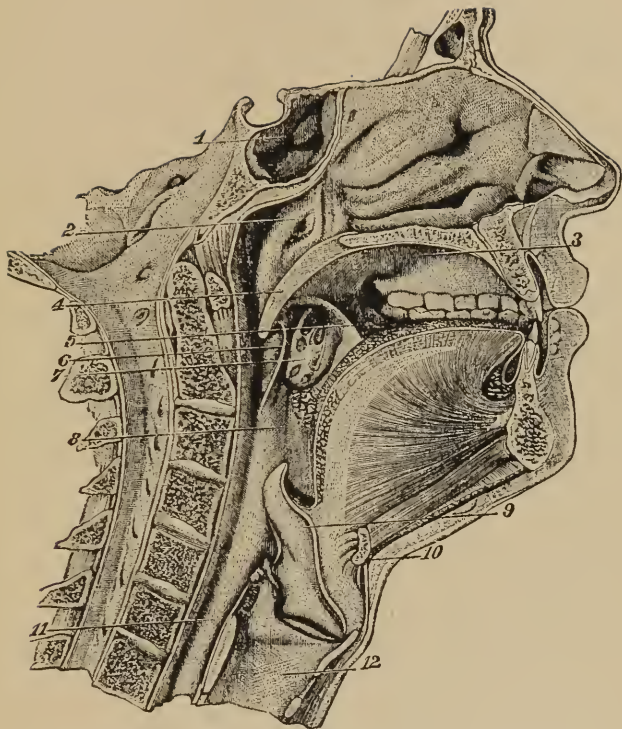
The bile is not known to possess any ferment-action, but it assists, by its alkaline reaction, in emulsifying fats. The ferment which transforms cane-sugar, strange to say, is not encountered until the food reaches the small intestine.

The digestive ferments are all the direct products of living cells. In their action upon foods, they give nothing material to, and take nothing material from the substance acted upon. They are all soluble in water.

Now let us briefly consider the digestive act in outline :

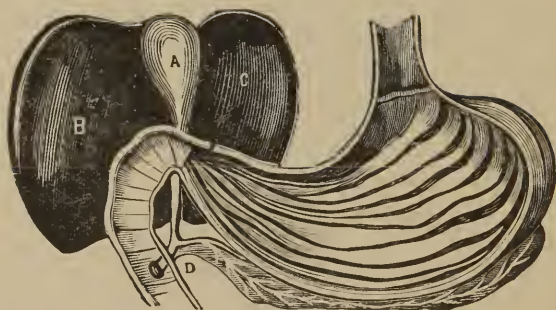
First, the starch of our food is acted upon by the saliva, which converts it into sugar; in this form, in the stomach, it is absorbed into the blood.

Then the albuminoid particles are acted upon by the stomach in two ways. By the movements of the stomach the process already begun by mastication, or chewing, is completed, and the food is reduced to minute fragments, upon which the gastric juice can act successfully. Thus muscular fibers, the best type



CUT SHOWING THE MOUTH AND PARTS ENGAGED IN THE
ACT OF SWALLOWING.

Section, in the median line, of the face and the superior portion of the neck, designed to show the mouth in its relations to the nasal fossæ, the pharynx, and the larynx.—1. Sphenoidal sinuses.—2. Internal orifice of the Eustachian tube.—3. Palatine arch.—4. Velum pendulum palati.—5. Anterior pillar of the soft palate.—6. Posterior pillar of the soft palate.—7. Tonsil.—8. Lingual portion of the cavity of the pharynx.—9. Epiglottis.—10. Section of the hyoid bone.—11. Laryngeal portion of the cavity of the pharynx.—12. Cavity of the larynx.—(*Sappey.*)



SECTION OF STOMACH SHOWING ITS INNER SURFACE.

B and C, the liver, is raised up, exhibiting A the Gall Bladder and Gall Duct; uniting at D with the duct of the Pancreas, and emptying into the small intestine called the Duodenum.

of albuminoid food, are crushed by the teeth, then rolled over in the stomach until the fibers fall asunder. So separated, each fiber can be acted upon by the solvent juice and digested. During this time fat has undergone no change. The saliva does not exercise any influence upon fatty matters; neither does the gastric juice. When the partially digested food passes through the pyloric ring of the stomach, then intestinal digestion commences, and the activity of the digested act reaches its height.

The saliva ferment is only active in an alkaline medium, consequently when the contents of the stomach become acid in the digestive act, the digestion of starch ceases. The contents of the stomach, rendered acid by the gastric juice, gradually become dissolved. When this is completed they pass out of the stomach into the intestine, where they meet with the alkaline bile salts; these at once arrest the action of the gastric juice, which is only active in the presence of an acid. But the scene only changes, not the act.

In this new alkaline medium the secretion of the *pancreas* comes into play. This secretion continues the digestion of the albuminoids, and the conversion of starch into sugar is once more in progress, and the fat is emulsionized, or converted into a soapy mass. Hitherto fat has been untouched by the digestive ferments; now it is reduced to the tiniest of particles, which process is called emulsionizing. In this form it is taken up by the absorbents of the intestine.

In the intestinal digestion, the starch converted into sugar finds its way into the intestinal veins; so do the digested albuminoids, while the fat is taken up by the villi which contain the terminal ends of the little *lacteals* or lymphatic vessels. The remainder, consisting of woody fibers, pieces of bone, indigestible matters of all kinds and any surplus, above what can be normally digested, passes from the body in the form of waste.

Such is a brief outline of the digestive act. Let us now examine the articles of food upon which we subsist.

What we eat may be said to consist of *starch*, *fats*, and *albuminoids*.

Starch is a hydro-carbon found in the seeds of plants, in palm-pith as sago, as tapioca in the cassava, as arrow-root from other tubers, and as potato starch. It is the material upon which the young plant feeds until it can get its own nutriment, except in the case of sago.

You must remember that vegetables, like animals, have an early infant life, when food is found for them by their parents. Just as the chick in the egg lives upon the material stored up within the shell, so the seed lives upon the starch and the fat stored up within the husk. These stores of material for the life of the young plant, are garnered for human food.

The digestion of starch within the body is allied in nature to that process by which the infant plant feeds upon the starch within the husk. The plant pulls the starch granules to pieces and renders the in-

soluble starch soluble. This is then brought into contact with a *ferment* contained within the seed.

This is just what happens in human digestion. Thus, while the teeth are crushing the food, and the tongue is rolling the mass over and over, it is being mixed with saliva, which contains a ferment capable of converting the starchy elements into sugar, in which condition they are readily absorbed when the mass reaches the stomach. Starch by itself is insoluble, and as such cannot be absorbed, but as it is converted into glucose or grape sugar by the action of the *salivary ferment*, it also takes up a molecule of water, which process is called hydration, and now it can pass through the walls of the capillaries and nourish the tissues.

All the starch which is converted into sugar is not needed by the system as soon as it is absorbed, and it cannot be stored up in the soluble form which we now find it, for it would be washed away. What then occurs? Why, Nature causes it to lose its added molecule of water, and then it can be safely stored up for future use. So you see that the digestive act is the dissolving of food, till in fluid form it can pass through the walls of the digestive tract into the blood.

Albuminoids.—From the albumen in the egg, the tissues of the chick are formed. From the albumen in the seed of the plant, the tissues of the germinating seedling are formed.

The tissues are formed almost exclusively from albumen. Nature has wisely chosen albumen as the

substance from which to form the tissues, for in these same tissues the process of oxidation, or burning up of the hydro-carbons, consisting of starches and fats, must take place, and the albuminoids do not readily oxidize themselves. It is like the coal burning in the steam engine, while the iron-work does not burn. The iron-work does not burn, but, by a slower process of oxidation, it *rusts* away. So it is with the albuminoid tissues of the body, they do not burn properly, but they slowly rust as they wear away.

Albuminoids are not affected by the saliva; the gastric juice is their solvent. It is upon albuminoids that "pepsin," the *gastric ferment*, exercises its sole action. Before the albumen is digested it is called a *proteid*, from the Greek god *Proteus*, who, at will, could change himself into any desired form; when digested, the proteid is called a *peptone*. In the form of peptones, albumen can readily pass through the walls of the digestive canal into the blood. This change is brought about as with the starch, by the addition of a molecule of water.

The solvent action of the gastric juice is greatly aided by the muscular movements of the stomach, which cause the mass to roll over and over and be brought into direct contact with the gastric juice. By this process muscular fibers are caused to fall asunder and gradually disappear in the stomach as the digestive act goes on. The whole of the albuminoids are not digested in the stomach, some are passed through the *pyloric ring*, and come in contact

with the *pancreatic* juice, when the final change takes place.

Fats.—It is only after the food has passed the pyloric ring that the digestion of fat commences. When the fat is brought into contact with the intestinal juices, it is reduced to an emulsion, a soapy sort of mass. This change is brought about by its division into minute particles, in which form it is readily taken up by the lymph vessels. Fat in the body of animals is formed from starch; when this substance is taken in excess of the bodily needs, the surplus is stored up as adipose tissue, or fat, as we say.

CHAPTER III.

INDIGESTION.

Since we have seen how the digestive act is carried on normally, we are now ready to study what takes place when, from some cause or other, this process is interfered with. We will begin with INDIGESTION. All digestion, then, is a process by which the food taken is rendered soluble, and for which previous disintegration is necessary. *Indigestion*, then, may be due to first, imperfect disintegration; second, defective solvent power.

Imperfect disintegration is mainly due to imperfect mastication. This is usually brought about by the bad practice of eating too fast; or else is due to bad teeth. Eating in company, and chatting pleasantly all the while, will remedy the first evil. In all instances should food be taken slowly and thoroughly chewed. Even when a glass of milk is swallowed, or a cup of beef tea, containing some baked flour, it is all the better for being taken slowly, and being to some extent mixed with the saliva, previous to being swallowed. You know well that when farmers' wives and daughters fed calves off the finger, so that they got their milk slowly, they did better and had less diarrhoea than now, when they are allowed to take their milk greedily, so that it curdles too firmly in the stomach. Too firm curdling of milk is a common cause of diarrhoea, both in human and bovine infants.

The curd is indigestible, so it is got rid of as readily as possible, by ejection from the bowels. In all cases where a milk diet is required, this too firm curdling should be looked to.

Bad teeth cause indigestion, from the fact that they prevent perfect mastication, and cause the food to be swallowed long before it is ready.

Imperfect separation of the food may be due to defective action in the stomach. The muscular coat of this organ may fail to act, or there may be an abnormal quantity of gastric mucus thrown off, in which the food is rolled over and over until it becomes coated with a thick mucus layer, which effectually resists the action of the gastric juice. Indigestion may be caused by ulcer and cancer of the stomach. Indigestion may be caused by an imperfect solvent action on the part of the juices. This fault may lie in the saliva, the gastric juice, or in the pancreatic secretion. The first will cause trouble when starch is taken; the second impaired digestion when albuminoids are taken, while the third will render the digestion of fats imperfect.

Symptoms.—The symptoms of indigestion, or dyspepsia, are numerous, and in no two cases are they exactly alike. Hence I will only attempt to give a few of the more prominent ones. The most common of all the symptoms of dyspepsia is *heartburn*. This condition is brought about by the formation of an acrid acid, probably a fatty acid, which rises up in the throat, causing the unpleasant pungent taste felt at the foot of the gullet.

Another is *pyrosis*, or *waterbrash*. This consists in the raising of a fluid into the throat and fauces, sometimes acid, sometimes alkaline, at other times acrid, at others again even a cold feeling. Certain articles of food, notably oat-meal, are apt to produce it. A third symptom is raising of food, sometimes sour, sometimes sweet. Allied to this last-named symptom is the "*eructations of wind*," or "*belching*," to many persons a great source of annoyance.

Flatulence or *bloating* is another outcome of indigestion, and this, in many cases, creates a most uncomfortable sense of distention. The pressure of this elastic gas in the stomach often causes *palpitation* of the heart, and the already wretched dyspeptic now imagines that he has some grave heart trouble.

Vomiting is a symptom, but not a common one, and usually comes on with acute indigestion or with gastric catarrh, and occurs in the latter case notably in the morning, especially if alcohol has been freely taken the previous evening. In acute dyspepsia, this is the natural form of attaining relief. This is often followed by sharp *diarrhœa*, sweeping away such part of the contents of the stomach as have passed into the intestinal tube. In some cases we find diarrhœa occurring after each meal.

Pain.—Then there is pain at the pit of the stomach. This may come on immediately after a meal, or at a later period when the contents of the stomach are passing the *pyloric ring* into the intestine.

Nausea, or a sense of sickness, is a very common

symptom, and may accompany pain or may occur alone.

Constipation frequently occurs with dyspepsia, and is often its exciting cause. So long as constipation is allowed to continue, just so long will dyspepsia persist.

The throat often feels sore, or uncomfortable; at other times there is a tendency to "hawk up phlegm" which collects in the fauces.

The tongue, in dyspepsia, should at all times be carefully examined. Sometimes it is *swollen*, relaxed, and indented with the teeth; at other times it is raw and irritable, having its outside skin peeled off. In other cases again it is *foul*, or loaded, and this fur may be yellow or brown. There may be a strawberry tongue looking like a red or white strawberry. Sometimes there is a foul streak running along the middle of the tongue. Fissures or cracks in the tongue are common, and are due to the practice of drinking hot fluid, especially tea.

Skin eruptions are very frequently connected with digestive disturbances. In some cases there is a "*taste in the mouth*," especially a hot burning taste on awaking in the morning. In certain cases there is a *sour taste* in the mouth, less commonly a sweet taste, or the saliva may be clammy, with a sensation of heat in the mouth; this latter is most commonly found with constipation.

Headache is a very common outcome of dyspepsia. This may be confined to the temples, the forehead, or

the back part of the head, or it may be general. This may be accompanied by "swimming" in the head and intolerance of light or sound. These headaches are the outcome of a meal taken the day previous. The face is often flushed, and the hands and feet are cold.

More distressing than the actual pain is the sense of misery felt by many. The feeling of discomfort, the sense of wretchedness, of utter unfitness for work, and inability to collect the thoughts, is to many dyspeptics their greatest trouble.

To brain workers this is a great drawback; indeed, the dyspeptic is handicapped very heavily in the race to gain a living or amass a fortune. The dyspeptic can earn less, and must spend more on suitable food than others do. Indigestion cuts down the individual far more than is generally credited. In the modern keen struggle for existence, the dyspeptic is like a man fighting with one hand tied.

This mental attitude of gloom, distrust, and incapacity, increases the physical discomfort, and tends to cause the sufferer to have misgivings that his trouble is more than indigestion.

He has a haunting fear that the brain is the seat of his trouble, where there is headache, and where there is palpitation or irregular action of the heart, he at once imagines some grave trouble here. There is indeed a feeling, or sense of dread, of impending evil, which embitters the sufferer's existence, and every uncomfortable sensation is thought to represent serious disease somewhere.

CHAPTER IV.

HOW TO PREPARE OUR FOOD.

“The more the labor of digestion can be economized, the more energy is left for the purposes of growth and action.”—*Herbert Spencer.*

Having described the various disturbances of the digestive track, interfering with the digestion and absorption of the ordinary articles of our diet, consisting of starch, albumen, and fats, it is now well for us to see how these various articles should be prepared in order to render them least capable of causing disturbance when eaten. I will describe this under the head of *How to Prepare our Food.*

Bear in mind that what we eat may be said to consist of *starch, albumen, and fats.* Starch is composed of numerous granules bound tightly together, and as such we see it in the raw state. Starch in its natural state, raw and uncooked, is scarcely digestible by man. In the lower animals starch is digested by the pancreatic juice, the lower animals having no ferment in their saliva; and, furthermore, the ferment of the saliva has no action on raw starch, so that if such properties were contained in the saliva of the horse, for example, it would be thrown away, for a horse takes his food raw. By cooking starch the granule is cracked, and the starch largely gelatinized, so that the salivary ferment readily liquifies it and converts it into soluble sugar.

The action of yeast converts part of the starch into sugar, and this again into "alcohol and carbonic acid gas;" the latter in its efforts to escape from the dough with which it is mixed, distends it, forming little spaces in its interior, so causing it to become porous or light, as we say. Much of the alcohol is driven off by baking.

Thus we see that by intuition and without the light of science, man has commenced the artificial digestion of starch when only a savage, and long before the dawn of history. We are just now emerging from a long period of darkness in regard to the artificial digestion of starch; by so doing economizing the body energy, which would otherwise be consumed in the conversion of insoluble starch into soluble sugar. Consequently starchy materials are first ground and then cooked. This constitutes the first part of the digestive act.

Now, it is a matter of no little importance to understand how cooking may affect the digestibility of prepared starch. When *farina* is simply boiled or baked with milk, the preparation is at once simple and digestible. But when eggs are added, then the disintegration in the mouth is not nearly so perfect, and much more chewing is required, because the albumen of the eggs holds the starch granules together, consequently milk puddings for invalids are better made without eggs.

Then everyone knows how indigestible is pastry of all kinds. When the starch and fat are closely

mixed together in the act of kneading the dough, the adhesive property of the gluten of flour is somehow so increased that the act of mastication is rarely sufficient in those cases where the digestion is feeble.

The gluten of wheat once cooked remains non-adhesive. So in making puddings, it is well to add a certain amount of bread-crumbs, as these cause the mass to fall readily to pieces in the stomach.

Corn flour is not nearly so adhesive as wheaten flour, hence in making puddings and pastry for delicate children it would be advisable to add some corn flour to that ordinarily used. In precisely the same way you should try and prevent milk forming too firm a curd in the stomach by mixing with it some starch. The presence of the starch granules interferes with the solidity of the curd, and causes it to fall to pieces readily in the stomach. On the other hand, oysters are spoiled in cooking. The oyster is almost the only animal substance which we eat habitually, and by preference, in the raw or uncooked state. The fawn-colored mass which constitutes the dainty of the oyster, is its liver. This is really a mass of glycogen or animal sugar, and with this, but withheld from actual contact with it during life, is its *digestive ferment*. By simply crushing this mass between the teeth, you bring the ferment in contact with the oyster, and without other help it will digest itself. Thus the oyster raw or merely warm, is, in fact, self-digestive.

The idea that long cooking increases the digestibility of food, is not always correct. But "cooking" is essen-

tially a part of the digestive process, not only in man, but in some domesticated animals as well.

With regard to the staple articles of our food, the practice of cooking it beforehand is universal. In the case of farinaceous or starchy articles, cooking is indispensable. When men under the stress of circumstances have been compelled to subsist on the uncooked grain of cereals, they have soon fallen into a state of inanition and disease. By cooking, starch is not only liberated from its protecting envelopes, but it suffers a chemical change, by which it is transformed into a gelatinous condition, and this greatly facilitates the attack of the digestive ferments. In regard to flesh meat, the advantage of cooking consists chiefly in its effects on the connective tissue, fibers, and their coverings. These are not only softened and separated by cooking, but are chemically converted into a soluble and easily digested form of gelatine.

Now as to the effect of cooking upon the albuminoid elements of our food. It is a well-known fact that disconnected tissue is much easier of digestion than closely aggregated tissue; as we said before, cooking breaks up the adhesion of muscular fibers, and must, therefore, render all kinds of meat easier to dissolve; to digest, as it were. *Hence, never give raw meat, no matter how finely it is chopped, as by so doing you forego all the advantages gained by judicious cooking, and force on the digestive organs double work. Moreover, raw meat may contain the eggs of trichinæ and tapeworms.*

When the cook makes a hash of meat already cooked, she should, in all instances, make the gravy first, then when this is fully prepared, put in the slices of meat and just warm them before serving. How often, however, does she stew the meat and gravy together believing that by doing so thoroughly, she increases the digestibility of the dish. But only ask dyspeptics about meat so cooked a second time, and their tale of woe is most instructive.

Chewing exerts no influence upon albuminous matters of a solvent character. Neither does the stomach act on fats, except to dissolve their albuminous covering.

Now, meats differ in their digestibility according to their closeness of fiber, and the firmness with which the fibers are bound together. Of all meats to digest, pork is the hardest; next comes veal, then beef, then mutton and lamb. The hare and the rabbit are fairly digestible as to disintegration. Then comes the flesh of fowls of all kinds, the finer fiber being specially digestible. Then comes the flesh of fish. Here it is not simply a matter of closeness of fiber, but also the manner of cooking. When the fibers are soaked in fat, they cannot be digested by a weak stomach. All sorts of white fish are most digestible when boiled.

The disintegration of muscular fiber in canned meats is complete; with those the solvent action of the gastric juice alone is required. Take thin slices of stale bread with a limited quantity of butter, then spread on this some canned meat, and you make a

very digestible meal. This, with a cup of beef tea, is indicated where milk cannot be taken.

Then we come to the vegetable albuminoids, composed of peas, beans, lentils, &c., all of which are best cooked to render digestion easy by boiling.

We do not, as yet, know of any change exercised upon fat by cooking, except that of rendering it fluid. Certainly cooking renders fat more toothsome. Heat liquifies fat and separates the various oils. It is well known that many persons can digest the liquid portion of fried bacon, where the solid portion cannot be digested. The fact that fats cannot be taken and digested, is the prime cause in many of lung troubles. The consumptive never can take fats. A great writer says, "The main causes of chronic lung troubles are the dearth of butter and the abundance of pastry cooks. The poor not getting sufficient fats, and the upper classes disordering their digestion by pastry."

Cod liver oil is the most digestible of all forms of fat, hence its universal use in consumption. Next to cod liver oil comes *cream*. Next to cream comes butter, then lard, then mutton suet and beef suet.

CHAPTER V.

WHAT TO EAT AND DRINK.

“What is one man’s meat is another man’s poison.”

These two practical matters require a few words to themselves. Of course what is said here only admits of a general application to cases of indigestion; each case requires to have the treatment fitted to it, just as a tailor fits a suit. Nevertheless some general advice may be useful, chiefly in the direction of *what is to be avoided*. And first and foremost here, comes the question of the *albuminoids*.

Starch, sugar, and fats, when once digested, cause but little trouble. It is their digestion which produces unpleasant conditions. Fat may cause trouble by being deposited in excess, that is all. A rich meal or a “surfeit,” as we say, upsets the liver, but it is the albuminoids which are the real source of difficulty. The fats and sugar burn up readily, leaving the less easily oxidizable albuminoids to cause the trouble. It is these *albuminoid elements which cause the disturbance after a surfeit*. It is the excess of albuminoids which cause biliousness and gout. We can truly say that it is the excess of albumen which we eat, beyond our requirements, that is the source of all our digestive woes. We overload the digestive organs and they break down under the load. *To eat food and digest it are not one and the same thing*. Indigestion leads to bad nutrition, and the old expression

the "wolf at the stomach," was applied to those cases where a ferocious appetite was associated with leanness. The ill-fed blood causes the sensation of hunger to be felt acutely. This is often seen after measles in children; they are hungry all day long. This is also seen in adults and children when other causes act to produce it besides measles. The more these persons eat the worse they thrive; and unless they are restricted to proper meals they will virtually eat themselves to death. They die of hunger in the midst of plenty.

Take, for example, the business man who, from over work, is run down and needs a holiday. Not only does his brain seem exhausted, but the whole system appears to be languid and weak. And yet all this time he may have been trying to keep up his strength. He takes butcher's meat two or three times a day, perhaps also strong soups, to say nothing of wine and brandy, to pick him up. His tissues ought to be getting sufficient nourishment to enable them to do their work, and yet it is evident they are not in a condition to do so. The man and his friends wonder why this is, and when he goes to his medical attendant he says: "I take all sorts of strengthening things, and yet I feel so weak." If he were to say "*because*" I take all sorts of strengthening things I feel so weak, he would better express the truth. *The products of imperfect digestion are a positive poison.* A little well digested, feeds the blood, and from it again, the tissues, better than a large meal, none or very little of which is properly digested.

Strong meat essences, beef tea, and meat juice are pleasant; and certainly patients think they are the proper things to take. Well, to give the starving patient these things to feed him, is giving him a stone when he asks for bread. A little light food, which can be digested, is infinitely better for him.

This is something like what should be given to the dyspeptic.

Breakfast.—Porridge, oat-meal, or hominy, with milk; then a little cold meat, or bacon, or fish properly cooked; and with this a cup of coffee, tea, or cocoa, not too hot, and some fruit. In some cases it is well to take the fruit before the other articles.

Lunch.—At one, P. M., if taken, should consist of some potatoes, mashed, with plenty of milk and butter; better still, cream, peppered and salted, and browned before the fire; a little cold minced meat, just warmed; then some cold pudding left over from the dinner of the day previous. A glass of milk, or claret, or sherry may be permissible. However, no glasses of wine are to be taken *between meals*.

Dinner.—Whether mid-day meal or taken in evening. A little light soup, some boiled fish, a very little roast meat, or an entrée, such as sweet bread or poached egg and spinach; some milk pudding and stewed fruit. One or two glasses of wine may be taken, such as claret, sherry, or Madeira.

Now as to dessert: Nuts are certainly not to be allowed the dyspeptic; oranges and grapes are good if only the juice be swallowed; apples, pears, plums,

gooseberries, cherries, peaches, and strawberries, all are good. These things are often unnecessarily forbidden. If they disagree, stop them; if not, they may be eaten. Bananas, figs, pineapples, raisins, may be taken in small quantities only; more especially is this the case with the two latter. Preserved peaches and apricots, when fresh fruit cannot be obtained, are good. Candied fruit is not admissible.

If supper be taken, let it consist of an arrowroot biscuit and a draught of milk.

When the fast between supper and breakfast is too long, a little milk and a biscuit in the small hours of the morning may be taken. A tumbler of milk, with a teaspoonful of rum or brandy, may be taken on getting out of bed in the morning. In other cases a glass of seltzer and milk may be taken to advantage. These measures will enable some persons to take a fair breakfast.

Some persons can eat no breakfast. Not uncommonly they eat their breakfast before they go to bed. They eat a large supper; this is very common with business people who work hard all day and have no rest until supper time.

Some dyspeptics find that they must take no fluids with their food; others require more fluids than they allow themselves.

Others require a biscuit or some light article of food betwixt meals. To take some fruit would be better in every way. Some succulent fruit would satisfy the craving for something. The use of fruit ought to be more general than it is at present.

In all households where the expense does not forbid it, a large dish of picked fruit of various kinds should be placed on the side-board every morning, with a label, "Help yourself." Children would soon cease to over-eat themselves. Such an idea is well worthy of adoption.

Fresh-gathered fruit out of the garden and orchard ought to be placed on the breakfast table every morning. For those who experience a bitter or hot taste in the morning on awaking, such addition to the breakfast table would be most acceptable.

And now a few words as to the beverages to be taken.

The Americans are a dyspeptic people; they drink much iced water at meals. Hence those abroad say iced drinks are bad. That this may be so when carried to excess, is not denied. But iced drinks are not the cause of the wide-spread dyspepsia of the United States.

Cold beverages at meal times are not desirable for dyspeptics. A certain temperature is requisite to carry on digestion, and the cold taken lowers this and renders the act more difficult.

So, too, the stomach is acid after a meal, for the stomach digestion is acid; therefore, alkaline waters should never be taken with or after a meal. If taken at all, it should be before a meal.

Of the alcoholic beverages I have but little to say. They are good or harmful, according to the use made of them. A little light French wine is admissible,

but should be invariably taken at meal times, and preferable toward the close of the meal.

Malt liquors are not suited to dyspeptics. But for the dyspeptic no rule absolute can be laid down in beverages, any more than in food. Each case requires its own regulation all through. Many cases of dyspepsia, especially where there is morning sickness, some catarrh, a foul tongue, excessive flatulence, and unsteady eye, is due to alcohol, and alcohol alone.

Whey, when it can be procured fresh, or skimmed milk is a splendid beverage for the dyspeptic. Although sugar is a very easily digested hydro-carbon, still it cannot be tolerated by many dyspeptics. Finally, tea and coffee are more or less troublesome to dyspeptics. Cocoa, not too full of fat, is better. Milk is still better. The cup of tea taken on getting up is entirely uncalled for, and is unquestionably bad; while the cup of strong tea or coffee after dinner should be avoided.

Now, to sum up in a few words about diet and drink:

Use moderation in taking foods, and more especially albuminoid articles. A little properly digested, is more nutritive than a feast, none of which is properly digested.

Use moderation in all drinks, and more especially the alcoholic ones. Neither total abstinence nor excess.

We eat and drink too much.

CHAPTER VI.

DYSPEPSIA IN AMERICA.

“What boots it to have attained wealth, if the wealth is accompanied by ceaseless ailments? What is the worth of distinction, if it has brought hypochondria with it?”—*Herbert Spenceer*.

Awhile ago I said the Americans, having reference to the people of the United States, were a dyspeptic people. Why is this? The causes, I claim, are four in number, viz:

I. Variety and change of climate, without corresponding change in diet.

II. Taking of cold drinks at meal times.

III. The nervous, restless spirit of the people.

IV. The excess of albuminoids eaten.

In America we have all sorts of climate, from that of the frigid regions to the intense heat of the tropics, and these changes alternate rapidly during a period of twelve months. We dress to suit these changes, but almost invariably neglect the matter of diet. How many persons here eat the same sort of diet all the year round! To prove that this is altogether wrong, I have but to call your attention to a few facts.

If we think for a moment, we will see that the dwellers of the cold regions subsist almost entirely on fats. To the Esquimaux a can of lard oil is preferable to the most exquisite meal prepared by the most skillful French cook. On the other hand, the natives of the tropics subsist almost entirely upon fruits, vege-

tables, and starches. You can scarcely persuade the dwellers of the Equator to eat fats and albuminoids. The reason for this is at once apparent. In the case of the Esquimaux living amidst the intense cold of the Arctic regions, he must keep up a constant fire within himself in order to counteract the cold from without, hence he must live upon that form of food which, as it undergoes chemical changes in the body, will generate the greatest amount of heat. Fat being a hydro-carbon and the greatest heat generator, he takes this. If he were to attempt to live without a fatty diet, he would freeze to death. On the other hand, the dweller of the hot regions has his heat furnished gratis, through the vertical rays of the sun, and all that he has to do is to take such articles of food as will nourish his tissues, and in doing this, generate as little heat as possible, and these are fruits, vegetables, and starches.

To prove that the dietary should be governed by the season and section, I have but to cite the case of the British East Indian. He goes from England to India, and utterly regardless of the teachings of nature, eats his favorite roast beef and mutton, and drinks, as was his custom in the old country, fabulous quantities of ale, beer, and spirits. What is the result? He generates too much heat, and so causes a constant congestion of the liver. Besides this, the liver has forced upon it extra work, splitting up and destroying the excess of albumen taken in the form of meat, very little of which is required in a hot cli-

mate, and the result is, first, an acute bilious attack, then chronic biliousness, and lastly, destruction of the liver. Many of you have seen the returned East Indian, with his dark mottled skin, showing serious liver difficulty. If this sort of thing be kept up too long, destruction of the liver will take place, and death follow as a result.

Bearing these facts in mind, many can remember an old bilious attack during the hot months, and by thinking a moment, they can see the cause. Always regulate the diet to suit the time of year. Take as an example the dwellers of the extremes, and see how they live, then adopt the measures to suit your own case.

II. Of the second cause for dyspepsia among the Americans, *cold drinks at meal time*, I have but to say that the practice is a bad one, from the fact that extreme cold taken into the stomach during digestion lowers the heat of the stomach, and causes that organ to do extra work in order to compensate for this.

III. *The nervous, restless spirit of the Yankee is proverbial.* The Englishman, Frenchman, and German, and almost every other human being is satisfied if he makes a comfortable living, at a business which, by care, he may lay up a small fortune by the time he has reached sixty or sixty-five. He takes his time at his place of business, and at his meals, leaves his place of business in the evening, and that is the end of it until the next day at 10, A. M. Not so with the Yankee; he wants to get rich in a few years, and re-

tire. He rises early, swallows his breakfast without hardly stopping to chew it, rushes to his place of business to see that his employés are at work early enough, works hard until noon, then hastily swallows some lunch, goes right back to business, works until closing time, then looks over his accounts. By this time the dinner hour has arrived, and he goes home hungry, and now he eats a meal sufficient for three. This, in itself, would not be so bad, but after doing this his brain once more wanders back to his office, and he schemes for the morrow, by so doing robbing the stomach of the requisite amount of blood to carry on the digestive process. The result of all this disregard of nature can be but one thing, namely, a general break down, first, of the digestive process, then of the nervous and muscular systems, and, finally, total unfitness for work, and unless proper measures are adopted at once, the result will be a confirmed invalid, hypochondriac, or lunatic.

IV. Of the excessive use of albuminoids, I spoke before, and now only say here that in the United States the excess in wages over that of other countries, places meat within the limits of the poorest laborer, and he thinks it his duty to take advantage of this, and consequently eats meat two or even three times a day. Indeed, with the rich and poor alike in this country, they think that no meal is what it should be unless meat forms the greater part of it. This excessive use of albuminoid food causes trouble by giving the liver too much to do in destroying these articles.

To prove that what I have before mentioned is true, I have but to cite the case of the North American Indian, who lives almost entirely upon albuminoids, and by many thought to be the most perfect type of health. But when we come to look closely into his history, we find that as a race they are the shortest lived out-door dwellers in the world, and the cause of this is clearly to be found in their diet. The vegetable-eating Hindoo lives to a surprising age, notwithstanding the malaria to which he is subjected, to say nothing of the famines to which he is constantly exposed. And the dwellers of northern Persia, a people living almost exclusively upon vegetables and fruits, live longer than any race on the face of the globe.

The man exposed to out-door exercise can digest the most albumen, but in the case of the Indian, his food is so much in excess of what should be taken, that he suffers.

CHAPTER VII.

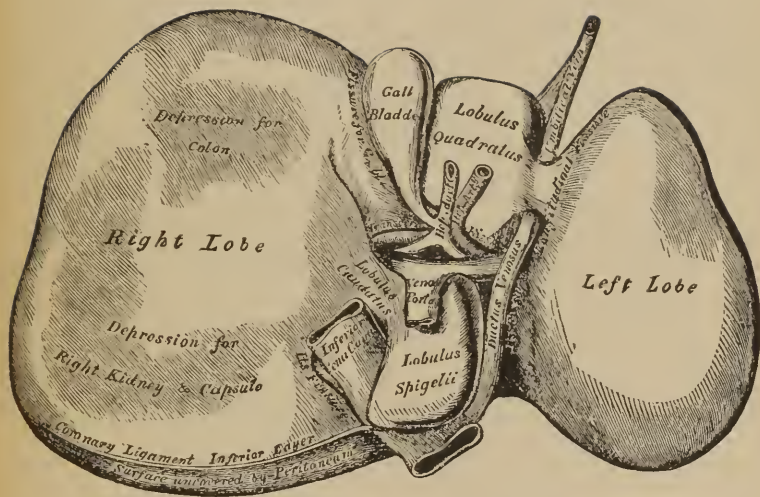
FUNCTIONS OF THE LIVER.

The liver is the largest gland in the body ; it is also the most important, according to its function.

Up to quite a recent date the liver was spoken of much in the same manner as the region which gives rise to the source of the river Nile, a mysterious space in the map of the body.

The shrewd medical man shook his head sagaciously in certain cases where he was puzzled, and knowingly pronounced the word "liver ;" ordered slops and a light diet ; the patient followed his instruction, and felt better for the treatment. Hence, the doctor said, when he met with one of these cases, "Slops and a light diet are the proper things for this trouble," and consequently ordered them. He never took the trouble to find out the cause for the sickness, and then set about to discover why a light diet and slops did good. When the older physicians, beginning away back with Galen, associated the liver and kidneys together, they were striking very close at the foundation of the matter. But as scientific observation of those times was only the result of guess-work, their ideas were pooh-poohed by the succeeding generations of medical men, and it was left for the physiologists of our own time to prove that the first were not far wrong.

Chemistry soon came to the assistance of the medi-



CUT OF THE LIVER, VIEWED FROM ITS UNDER SURFACE, SHOWING ITS FIVE LOBES, GALL BLADDER, AND BLOOD VESSELS.—(Gray.)

cal man, and the chemist found certain solids in the urine, and the medical man at once jumped at the conclusion that these matters were formed in the kidneys. Could anything be more simple? According to his convictions, when the urine contained abnormal constituents, the kidneys must be out of order. So he gave a diuretic, and stirred these organs up. Woe was the only result of such treatment, and its continuous practice could only result in the destruction of these organs.

A few years since the kidneys and the iodide of potassium were about the only subjects thought worthy of notice connected with medicine. They considered almost all forms of disease due to kidney trouble, and gave their potash to cure this. It is true the potash did good for a time, but in a short period the old trouble was back again, and once more was the iodide shoveled into the unfortunate.

Of late, however, I am happy to state that the truth has been reached beyond question. Claude Bernard, of France, and Foster, of England, and Ludwig, of Leipsic, have settled this matter conclusively, and have proven what the function of this great glandular organ really is.

To sum up their results in a few words, I will say that the function of the liver may be summed up under three heads, viz :

I. The formation of animal sugar from the starch of the food. This animal sugar assists in the generation of bodily heat, contributes to the nutrition of the

blood and tissues, and is the material from which the white corpuscles of the blood are formed.

II. The liver is the seat of the destruction of albuminoid matters, and the formation of urea, and other products, which are subsequently separated from the blood by the kidneys.

III. The third function of the liver is the secretion of bile, the greater part of which is re-absorbed into the blood. The function of the bile is that it assists in emulsifying of fats, and that it stimulates the bowels, and thus assists in their peristaltic or worm-like movements. Besides this, the bile contains considerable waste matters. We now recognize that the liver is the store-house of our fuel food, in the form of animal sugar or glycogen. This is converted into sugar, as it is required for the wants of the body, by a ferment contained in the liver itself. It is the same process in the body as in the plant. The plant digests its stored starch as it requires, by first converting it into sugar.

As to the second function of the liver, we have much to learn. We see its action on surplus and waste albuminoids; we know that urea is formed by the liver and not by the kidneys; we begin to see that lithiasis is primarily a disease of the liver. This is a condition where the blood is filled with a salt of a poisonous nature, which the kidneys undertake to separate, and in doing so gives rise to a dark red color to the urine, which if allowed to stand will form a sediment in the vessel. And we know that this extra

work which the kidneys have forced upon them, will, in time, cause disease of these organs, and finally their destruction.

We can truly say that "kidney degeneration is a consequence of the long-continued separation from the blood of products of faulty digestion, through the kidneys."

We know further, that the worn-out red-blood corpuscles find their grave in the liver, and that the material which results from their destruction gives to the bile and urine their colors.

With this as an introduction, we are ready to pass on to the next subject, biliousness or disordered liver function, first bearing in mind the following facts, namely: The liver is a most important organ in the conversion of the products of digestion into nutritive materials, and that it also *destroys by oxidation certain waste matters, and any surplus of albuminoid material which may exist.*

Disorders of the liver, then, will give us maladies, of which some account will be furnished in the ensuing chapter.

CHAPTER VIII.

BILIOUSNESS.

"The yellow gall that in your bosom floats,
Engenders all these melancholy thoughts."

—*Dryden.*

From what has been said in the previous chapter as to the function of the liver, the reader will be prepared for an explanation of certain well-known and equally well-marked phenomena.

It is quite a common experience, with children especially, to see an acute "bilious attack" follow over indulgence in rich food. Some persons are "upset" by what are quite ordinary meals with other people. Even a little rich cake is sufficient in some to disturb the digestive system, to produce nausea with headache, followed by actual vomiting, giving great relief, and sometimes by actual purging; after which the individual resumes his wonted state of health. This well describes the symptoms of an acute bilious attack, and a condition which every medical man of experience has seen over and over again.

About the cause of this attack the mother of the child is perfectly certain, she tells you, with the most unhesitating confidence, that "it was the sweets and the rich cake that caused all the mischief. Anything too rich, either with sugar or butter, always upsets that child!" The old family doctor nods his venerable head in complacent acquiescence, and "that child"

is carefully watched in the future as to its eating, especially in reference to sugar and fatty food, in anything like excess. This theory, however widely accepted, is not true, and it is of interest to "that child," to other children similarly circumstanced, and indeed to the whole world, that this false idea be thrashed out.

From what was said in the last chapter, it is abundantly clear that it is the chemical changes undergone by the albuminoids in the liver, which caused these disturbances. The readily oxidizable hydro-carbons, the starches and fats, burn up quickly without trouble, unless it is the heart-burn excited by the generation of some fatty acid in the stomach.

The albuminoid tissues of the body do not themselves burn, while the fuel-food burns in them, just as the works of a steam engine do not burn, with the coals burning in the furnace. It is the albumen which, in its conversion from peptones into bile acids and urine solids, causes the troubles in the liver. The liver is the furnace in which the waste and surplus nitrogenized matters are burnt. The attack of biliousness is the old-fashioned "surfeit," that is, a meal where the palate is followed regardless of the wants of the body. In other words, the individual eats more of certain materials than what is good for him or her. Unless a portion of this extra food is gotten rid of by vomiting or diarrhoea, it must be destroyed or oxidized by the liver. All are familiar with the very sudden and sharp rise in temperature which accompanies acute

indigestion. The system in these cases is holding a bonfire to the great discomfort of the child, the dismay of its mother and nurse, and the benefit of the family doctor.

Now this acute bilious attack is undoubtedly preceded by indulgence in rich food, by which is usually meant sugar and butter; but it will not do to overlook the eggs used in the preparation of the "good things" in which the youthful appetite delights.

Some persons can eat and drink fabulous amounts of different materials, which, in others, would produce the most dire results, while they do not seem to mind the excess, but sooner or later their Nemesis will overtake them in the form of chronic biliousness. There are individuals, adults as well as children, who are upset by what would not be regarded as indulgence by others. Dr. Murchison says that most persons have more liver, just as they have more lung, than is absolutely necessary for the due performance of its function. But in others, not unfrequently the offspring of gouty parents, the organ in its natural condition seems only just capable of performing its healthy functions under the most favorable circumstances, and derangement is at once induced by articles of diet which most persons digest with facility. In some persons again, their livers, though of normal size, are sluggish and torpid in their actions, and in these cases bilious disturbances are readily produced.

It is the big dinners and suppers which upset these beings with the congenital inactive or small livers.

Tea, with cream and sugar, tongue or ham, with bread and butter, or buttered toast, or muffins, or waffles; then these last with jam or marmalade, followed by cheese-cakes, jam-tarts, and a good slice of pound-cake or plum-cake, to finish up with; this is the sort of meal to properly upset a child whose liver is not at all what it might be.

Such a "feed" is well enough for healthy children, with the appetite of a polar bear, and the digestion of an ostrich; but for the bilious child or adult it is an instance that one "man's meat is another man's poison."

After this tea-party, the child goes home to bed and awakens sick and feverish. It vomits freely, and gets relief, or it may not be so quickly relieved. It has high fever in an hour or two, and now may vomit pure bile, usually followed by purging, and then it gets relief.

At other times, more especially in adults, the attack is less acute. There is headache, a foul tongue, with a bitter taste in the mouth, and a loss of appetite.

Now, it is the prevention, rather than the treatment of such cases that calls for our attention. The avoidance of the "surfeit" is too clear to call attention to this. So long as fats and sugars are held to blame for the attack, so long will the disease remain. The individual will be allowed albuminoids, and be restricted in the matter of hydro-carbons, and the tendency to be bilious will be directly fostered.

What is the proper treatment, dietetic and medicinal, of this state of affairs? Dietetically, it should be the avoidance of albuminoids in all forms, in any quantity. The food should consist of starchy matters, fruit natural or stewed, vegetables, fish, or a *little white meat*. Butter, cream, oil, and fat are not forbidden.

Medicinally, a liver stimulant of some sort should be given, such as a dinner pill followed by a saline purgative the next morning. Such, for example, as a dose of epsom salts in *warm water*. With this, plenty of out-door exercise should be taken.

It is now time to consider, in detail, another form of liver disturbance, namely: Chronic biliousness.

Chronic biliousness or biliousness proper is a form of liver disturbance found in persons naturally "bilious." Such persons are ordinarily dark, often swarthy, but by no means necessarily so. The typical bilious individual is dark, with black hair. The skin is thick, wanting in transparency; even if not actually "muddy," there is a great development of pigment. The eyes are dark, and the white portions of the eyes have a decidedly yellow hue. When very marked, the individual looks "steeped" in bile; the yellow stain showing itself everywhere. The dark skin not uncommonly shows a number of freckles on the face. The hands are dark, and never white; indeed, the hue is that of the lighter colored of the dark races.

These bilious individuals may be active, may be lazy, may be careful in their living, or may be care-

less, but they suffer for their indiscretions. Their digestive canal is the bane of their life. Their appetite is capricious, and this is an advantage, as the less they eat the less work is forced upon the liver. Their bowels are rarely regular; commonly they are constipated, and usually they have an attack of diarrhoea as the "bilious attack" is passing away. They commonly have headache, and, as a rule, their temper is irritable. They are not, as a rule, lively people, rather they are gloomy or morose.

The dark swarthy Stuarts, one branch of the royal family of England, were a bilious people. After reproaching the Duke of Grafton on his descent from Charles the Second, Junius says: "There are some hereditary strokes of character by which a family may be as clearly distinguished as by the blackest features of the human face. Sullen and severe without religion, profligate without gayety, you live like Charles the Second, without being an amiable companion; and, for aught I know, may die as his father did, without the reputation of a martyr." The swarthy skin, the peculiar turn of mind, are each a part of the bilious temperament. When under the influence of a bilious attack, this mental attitude is aggravated, and the irritability and depression are pronounced. The character of James the Second is in harmony with a persistent biliousness.

Dr. Murchison says: "The symptoms, usually associated with deficient excretion of bile, or chronic biliousness, are an irregular costive state of the bowels;

loss of appetite, a white or yellowish tongue; a disagreeable, often bitter taste in the mouth, especially in the morning; flatulency, (bloating;) a yellow or muddy tint of skin; dingy eyes; languor and disinclination for exertion; frontal headache; dulness and heaviness; drowsiness after meals; great depression of spirits, and frequent deposits in the urine. These deposits may be white, fawn-colored, or "brick-dust," in hue. These symptoms are very apt to be induced, especially towards middle life, by sedentary and indolent habits, the habitual use of rich or indigestible food, neglect of the bowels, great or protracted anxiety of mind, or by a general want of vigor, due to breaking down of the heart or some other organ."

That these symptoms should not exist in health, is clearly proven by experience. We know that instead of producing languor and gloomy thoughts, the digestive act should give us agreeable sensations, a part of which is a sense of energy. But this varies. A small meal is more apt to give the sense of energy and well-being; while a full meal gives a very pleasant sense of well-being, combined with a disinclination to exertion. That the mental associations of normal digestion are pleasant there can be no doubt. Young ladies talk to their papas after dinner about their lovers, when they know that some objections exist to them in the paternal mind. Manmas know this, too. "A hungry man is an angry man;" when a man's stomach is full he is inclined to be amiable. But

when the products of digestion are unhealthy, then the direct opposite is the result.

Besides the symptoms before enumerated, there occurs with biliousness itching of the skin and neuralgias, especially of the head and face. Then there may be dimness of vision, buzzing and roaring in the ears ; or there may be vertigo, or a sense of dizziness, or swimming produced. The heart almost always shows some disordered action. It beats slow and irregular, and considerable pain is felt in the region of the organ.

Irritability of temper almost always goes with biliousness, and the expression "pure cussedness" seems to have been originated for the direct purpose of expressing the character of one of these bile disturbed individuals. These poor sufferers often become quite alarmed at what they style their own perversity and innate wickedness. They, in some cases, go so far as to believe they have lost their hope of a future happiness, or that they have "committed the unpardonable sin," as one wretched man told me.

The late Thomas Carlyle knew what this horrible feeling was. He says : "The accursed hag dyspepsia had got me bitted and bridled, and was ever striving to make my living-day a thing of ghastly nightmares ; I resisted what I could, never did yield or surrender to her ; but she kept my heart quite heavy, my battle being sore and hopeless." These attitudes of mental gloom invariably leave the person the moment his or her liver is set to rights.

Sleeplessness is another symptom much complained of by these bilious patients. The patient complains of inability to sleep; in vain is it courted for hours—it will not be wooed. These sleepless hours are in themselves barely tolerable; but when, in addition to this, the disturbed action of the heart is present, the condition becomes almost unbearable. The sleepless patient feels at times as if the heart would stop, its pulsations become so slow and feeble. Depressed before, this deepens his gloom, and the sense of misery is increased by his fears of death. When there is palpitation, the case is different. In the silent watches of the night, the sufferer is suddenly wakened out of sleep by a violent attack of palpitation. This is bad enough, but when the violent beats are succeeded by apparent sudden stoppage of the heart, then the dread is awful. So long as the heart is violently beating, the sufferer is comparatively easy in mind, but when the sense of stoppage comes, then the sensation is that of dying.

Sleeplessness may, of course, arise from many different causes, but its most frequent cause is derangement of the liver, with the production of lithates.

The deposit of a sediment in the urine, on cooling, of a substance either white, fawn-colored, or brick-dust color, means not kidney disease, but functional derangement of the liver. It means that the liver has too much work forced upon it in the way of destroying the excess of albumen taken in our food. This sediment is either uric acid, lithic acid, or lithates, and

would have been converted into urea had the liver been up to the proper standard of health. If the deposit is uric acid, it shows that the liver failed just on the border of performing its accustomed work; if the deposit be lithates, then it shows more serious difficulty, and that the process was stopped still earlier. Remember, these deposits are not chemically changed waste matters, but chemically changed albumen, which has been taken in excess of the bodily needs. It was never tissue, but would have been such had the liver been able to carry on its proper function.

These deposits are formed in the liver, and only separated from the blood by the kidneys. They are deposited in the form of crystals, with sharp edges, which, as they pass through the kidneys, set up irritation, and finally destroy these organs, and induce grave disease. This is one cause of Bright's disease. Renal calculi, or stone in the kidney, is formed from a collection of these deposits.

Gout is a disease induced by the improper digestion of albuminoids. Instead of being changed into urea, as in health, the process stops at uric acid, and the blood becomes so heavily charged with this poison that an acute attack is induced, consisting of fever and pain.

Gout is simply a disease induced by a deranged and over-worked liver.

CHAPTER IX.

TREATMENT OF LIVER DISTURBANCES.

“Woe to them that are at ease.”
— *Carlyle*.

What is said in this connection will be mainly in the direction of preventing the disturbances of the liver, or when once contracted, of showing how the dietary and general condition should be provided for.

A thought comes up just at this point, and may be of interest to the reader, namely: “The subject of the preservation of beauty?” First let us see what beauty really is. Beauty consists in perfect health, and this includes healthy digestive organs.

The old adage that beauty is but skin deep is correct, and a beautiful skin must be a healthy skin. Now, there are many things which may act to produce an unhealthy and at the same time ugly skin, but one thing is equally certain, and that is, you cannot have a clear healthy skin where you have a crippled digestive process which is constantly manufacturing poisonous materials and throwing these into the blood.

The secret of Mrs. Langtry's great beauty is her perfect health. The secret of all those beautiful complexions is a healthy liver, no more.

Herbert Spencer, speaking of female beauty, remarks: “What constitutes beauty in woman? What are the chief elements of female attraction? Do they consist of a knowledge of history, Latin, or German?

No! decidedly no! Men care more for physical beauty, and good nature, and sound sense. What man ever fell in love with a woman because she understood Spanish? But rosy cheeks and laughing eyes are great attractions. A finely rounded figure draws admiring glances. The liveliness and good humor that overflowing health produces go a great way towards establishing attachments. Every one knows cases where bodily perfections, in the absence of all other recommendations, have incited a passion that carried all before it; but scarcely anyone can point to a case where mere intellectual acquirements, apart from moral or physical attributes, have aroused such a feeling. The truth is, that out of the many elements uniting in various proportions to produce in a man's breast that complex emotion which we call love, the strongest are those produced by physical attractions."

The most beautiful and most perfect people on the face of the globe are the Circassians, and they owe their beauty to their healthy livers, and these, again, to their exercise in the open air and their strict dietary regulations.

So beautifully formed are these people that De Lagny, in his account of a visit to the eastern tribes of Circassia, describes the horrible sight of a battlefield in the rocky valley of Halistan, where the day before six Russian regiments had been routed by the Lesghian mountaineers. "But the victory was dearly bought," says he; "in the bed of the river and all along the northern shore we found the unburied bodies of

the heroes who had died in defense of their country. R—— was overcome by the sight and asked us to hurry on; but on the outskirts of a chestnut grove that shades the valley of a tributary creek, he suddenly stopped, and soon we were all assembled around the body of a Lesghian warrior, who had fallen, with a bullet through his head, at the foot of a shattered tree. The man wore the green scarf of his tribe, and, from the profusion of ornaments on his belt and his neck, seemed to have been a chieftain among his companions. Yet it was not his grotesque attire, nor his form, which was that of a Hercules, which held us spellbound—it was his face, a face which, in manly beauty, exceeded anything Phidias or Thorwaldsen ever expressed in marble. We stood around, almost immovable, as men will before a phenomenon they may see once and no more. No one spoke a word, till Surgeon Herbert, of the Chasseurs d’Afrique, broke the silence; baring his head—‘Hats off, messieurs, we stand before the image of God!’”

“The Circassians are teetotallers by religion, and vegetarians by preference; figs, honey, barley cakes, and milk being the staples of their diet.” They take but sparingly of the albuminoids, hence their healthy livers.

If we wish to retain our beauty and insure a healthy liver, we must live somewhat likewise.

Let your dietary be as follows:

Fruit, raw, cooked or canned, once or twice a day; all sorts of vegetables, when they do not affect the

stomach digestion. Then plenty of milk, and this with the yolk of the egg, for invalids, is permissible. Now of fishes, salmon is objectionable. Fried sole is never to be taken. Really, fried fish should never be eaten. Plain boiled is permissible. Mackerel and herring are to be avoided, unless plain boiled. The flesh of all white fish may be taken when boiled. Whiting, red mullet, and trout are good in limited quantities. Eels are apt to disagree with the stomach. Shrimps and prawns are good. Lobster and crab are quite indigestible, and should only be taken in moderation. Oysters are good, and so are mussels, for those who like them.

Of fowls, fair quantities may be taken, but their flesh is rich in albuminoids, be it remembered. First comes the chicken boiled, cold, with or without salad, if the stomach approves. Then the pigeon, the pheasant, and the partridge, grouse, black game, prairie fowls, quails, snipe, all in limited quantities are permissible. The duck, the goose, and the turkey, unless it be a little of the breast, are to be avoided.

Of "flesh-meat," pork is poison. Beef is less objectionable, and so is mutton. A little of either, cold, may be taken at lunch. Veal is to be avoided, unless it be in the form of sweet-bread. Lamb's-fry is permissible, or lamb's head, boiled, is often nice for a weak stomach.

Of canned meats, they offer no difficulties in the way of disintegration; any may be taken as sandwiches, made with thin slices of stale bread, with the

butter rubbed well into the bread, and spread not too thick.

Bread may be eaten, best stale, or as whole-meal bread; then biscuits are digestible. Toast tempts some.

Farinaceous matters may be cooked with milk, as oat-meal porridge, hominy, steam-crushed cereals, "Cerealine," a delightful combination, good in many ways. Boiled with milk, and poured into a pie-dish to stand over night, and next morning cut in thin slices and fried, it looks like the most tempting white fish, and is delicious. Hominy so treated also is good. Indeed, if farinaceous foods agree with the patient, a large variety of simple dishes can be prepared, especially with milk.

Soups are contra-indicated, unless it be a little gravy soup, the poorer the better. Pastry is objectionable, on account of its indigestibility in the stomach. But with those with whom it does not disagree, there is no objection to its use.

The sort of daily dietary to be arrived at has been sketched out in Chapter V, p. 27, as suited for indigestion; and to this the reader may return, and peruse it, and re-peruse it, with advantage.

We all know, as age advances, the digestive organs begin to fail. Gout is a disease of middle life. The work that the liver has to do day by day, tells upon it. The arrangements which change grape sugar into glycogen or animal sugar, and animal sugar back again into grape sugar, become disturbed, and diabetes is the consequence; or the splitting up of the albuminoids

is perverted, and lithic acid is largely formed, instead of urea, and then gout is the result.

The energy of manhood will enable the system to burn up much food which may not be absolutely demanded, but which is, at least, not harmful. But as old age approaches, then this surplus becomes baneful. *A natural failure of the appetite follows*, which should be respected and not struggled with. When this failure of the appetite comes on with age, it is Nature's way of showing you that your body does not need as much material to carry on the functions of life as was formerly the case, and you had best leave the matter alone.

All attempts to excite the appetite at this *time with bitters, should be avoided*. The appetites vary with advancing years. The mistress gives way to the cook, and the skill of the latter, like the charms of the former, is full of danger to the owner. At this time of life, the more skillful the cook, the more dangerous is she as a member of the household. If the sufferer cannot, by the aid of reason, limit his appetite, then should the expert cook be discharged and one of less skill taken instead. Then, never arouse the flagging appetite by a drink of bitters, sherry, gin, or any other form of appetizer taken before meals.

Now many of my readers will be dissatisfied unless I say something about how biliousness may be remedied by the aid of medicine. I will try to gratify your curiosity, but in doing so, must remind you that each case of biliousness requires its own separate course

of treatment, and what I say in this connection, will only apply to biliousness in general. It has been found that an attack of biliousness was always relieved by a blue pill taken at bed time, followed in the morning by a dose of black draught, which is a vile concoction made from salts and sennæ. Such a course was practiced year in and year out, and was followed by bad effects, and should never be adopted. The reason why it did good, was that the blue pill containing, as it does, mercury, stimulated the liver to extra exertion, while the purgative in the form of the salts and sennæ came along and swept away a portion of the meal, and so relieved the liver of part of its work. The result of this treatment continued for any length of time can only be bad, leaving the intestinal tract in a state of torpidity, thus producing constipation of the worst sort, for as soon as the irritant effects of the purgative has worn away, torpidity of the bowels always follow.

As I before said, in all cases the diet must first be looked to. Cut off the excess of albumen and sugar, avoid all alcoholic drinks, with the exception of a little light wine at dinner. Then dress warmly about the body, so keeping the liver warm. But there are persons whom experience, even, cannot teach. Still, warning may do them good, if persisted in. These are the persons who, instead of practicing moderation when their Nemesis overtakes them, or when they apprehend a bilious attack, at once fly to their anti-bilious pill and the morning draught, either black-

draught, Hunyadi Janos, or citrate of magnesia. By this means they cultivate a bad habit, and like other foolish people, "reap as they have sown," and in time become the subject of well-established or chronic biliousness. Such bilious individuals, lacking in discretion, are, as a rule, to be found among the female sex, and are usually young.

What I give in all these cases of acute-biliousness, is a liver stimulant, followed in the morning by a saline, given warm, and combined with a bitter infusion. Thus I usually give the following pill at night:

R

Ext. Colocynth Co., grs. iij

Ext. Belladonnae, gr. $\frac{1}{4}$

Ext. Nucis Vomicae, gr. $\frac{1}{2}$

M—Take at night on retiring.

This pill I find to be very servicable in those cases of chronic constipation occurring with biliousness; then in the morning I give—

Sulph. Sodæ, $\mathfrak{z}\frac{1}{2}$ to $\mathfrak{z}1$

Inf. Gentian, $\mathfrak{z}j$

Warm water, q. s. ad., $\mathfrak{z}6$

M—Take—

Or,

Sulp. Magnesia, (Epsom salts,) $\mathfrak{z}\frac{1}{2}$ to $\mathfrak{z}1$

Inf. Gentian, $\mathfrak{z}j$

Quinine, grs. 4

Warm water, q. s. ad., $\mathfrak{z}6$

M—Take—

I find the addition of a bitter infusion in the form of the gentian or quinine, in all these cases, improves the action of the saline.

In some cases a rhubarb pill at bed time is the proper thing, or the following may be taken to advantage :

R

Soda, bi-carb., 31

Ext. Fl. Rhei., 3½

Spts. Minth. Pip., 31

Aquae, q. s. ad., 3½

M—Take—

In some cases, again, a blue pill at night, followed in the morning with one of the salines enumerated above, may be given to advantage.

In those cases where medicine cannot be taken, a hot poultice should be applied over the region of the liver. This poulticing should be kept up until relief is obtained.

Remember one thing, and that is, potash and all its salts are poison to the muscles, and hence should rarely be given in these cases of biliousness. These salts depress the action of the heart wonderfully. The salts of soda are very much to be preferred.

But no matter what form of treatment is devised, remember that if good is to result from it, you must regulate your dietary, so that the already crippled liver may assume something like a degree of health, and to do this you must avoid those articles of diet which cause embarrassment of this organ.

As regards the use of table-waters, I have only to say :

Avoid all alkaline waters at meal times ; if taken at all, let them be taken some time before eating.

Chalybeates or iron waters are never to be taken by the bilious individual.

Sea bathing should be but seldom indulged in by a person with a bad liver, and more especially is this to be avoided in the early morning. When a sea bath is taken, let the dip be quick, and stop before a chill is produced.

Use moderation in regard to all alcoholic drinks and fermented beverages.

Take plenty of out-door exercise, and the best form for this is horse-back riding.

As a people, we take entirely too little out-door exercise. And more especially do we see the ill-effects of too much in-door life making itself known in the case of our women. Many ladies do not go out for a walk once a week, when in truth they should take a long walk every day, no matter what the state of the weather may be; dress to suit the day, and then go ahead. Follow the example of the Englishwoman. She does not stay in because the streets may be a little muddy, but dons her heavy shoes and wraps, and then she is ready for a tramp, no matter what may be the condition of the outer world. In a point of health, the Englishwoman is a great contrast to our ladies of America. Besides this, they engage in many out-door sports which many of our women think unwomanly, namely: horse-back riding, fox hunting, skating, &c. All that I have to say on the matter is, you will do well to follow the example of your less delicate sisters across the Atlantic, even though your complexion should wear at times a shade slightly resembling tan.

By carefully following the foregoing suggestions, the health will be kept perfect, a beautiful skin will result, and all of nature's charms will remain far on to the spring time of life. The hair will retain its natural color, and, at the same time, its place on the scalp. The teeth will cease decaying, and the dentist will no longer find you a profitable visitor. You will raise a healthy offspring, and enjoy a happy life generally. It is *worth the trial*.

Remember that all the liver troubles which you induce in yourself during life, you will transmit to your offspring, and if you will not listen to reason for your own sake, at least use moderation in your way of living for the sake of the future health of your children. A sufferer from disease of his digestive organs never begets a healthy offspring. They may appear healthy while young, but as they reach maturity they begin to show signs of approaching trouble.

CHAPTER X.

THE FAILURE OF THE DIGESTIVE ORGANS AT THE
PRESENT TIME.

What I have said in the foregoing chapters must have lead you to believe that there actually exists a strong tendency to failure in the organic processes of the body at the present day. The tremendous demands made upon the nervous system at the present time, are believed, by most competent observers, to be the cause of this failure.

Herbert Spencer, in speaking of physical education, says: "Omitting from the comparison the laboring classes, we have noticed a majority of cases in which the children do not reach the stature of their parents; and in massiveness, making due allowance for difference of age, there seems a like inferiority. In health, the contrast appears still greater. Men of past generations, living riotously as they did, could bear much more than men of the present generation, who live soberly, can bear. Though they drank hard, kept irregular hours, were regardless of fresh air, and thought little of cleanliness, our recent ancestors were capable of prolonged application without injury, even to a ripe old age; witness the annals of the bench and the bar. Yet we who think much about our bodily welfare; who eat with moderation, and do not drink to excess; who attend to ventilation, and use frequent

ablutions; who make annual excursions, and have the benefit of greater medical knowledge—we are continually breaking down under our work. Paying considerable attention to the laws of health, we seem to be weaker than our grandfathers who, in many respects, defied the laws of health. And, judging from the appearance and frequent ailments of the rising generation, they are likely to be even less robust than ourselves. What is the meaning of this? It means that there has been a most detrimental influence at work, in the form of excessive mental application."

The effects of mental emotion and worry upon the digestive and secretory functions, are well-known. The increased demand upon the nervous system, and especially the brain, in the present day, is telling upon the whole of the digestive organs, and especially upon the liver. The dental caries, or decay of the teeth, so prevalent, indeed universal, at the present day, is but a part of the general wide-spread failure of the digestive organs. Our grand-parents never heard the word "dentist," but the present generation know him well. The increased demand for laxative medicines is demonstrated by the perpetual advertisements which meet the eye, from natural waters, through an almost endless series, to Sehenek's pills. Constipation is not claimed to be a modern malady. What I mean to assert is that it is on the increase. Up to the days of our parents, children had porridge and milk for breakfast, took them well, digested and thrived on them. The Western man, on the boundless prairie,

is "raised upon hominy," and in his physique is a contrast to the product of the Eastern States.

Whence comes this great difference between these two individuals? Why, it is the effect of modern demand upon the nervous system. We know that the body is influenced in the direction of deterioration by subtle forces. The inability of the Anglo-Saxon to inhabit India is a well-known fact. The children of Anglo-Saxon parents, born and reared in India, deteriorate so markedly that it is now quite usual to send the young Anglo-Indian to Europe to be reared and educated. It is said that in the third generation the Anglo-Indian dies.

The same fatality has been found to attach itself to the aborigines of large towns. It appears that without regular and repeated infusions of new blood by incomers from the country, the town dweller would perish off the face of the earth. A deterioration is wrought by a protracted residence in a large town. Lugol says: "Scrofula shows itself in the third generation of those whose ancestors entered Paris full of health and vigor, and from the third generation the malady rages, even to the utter extermination of the family name." The same holds good with New York. From this it would seem that town-dwellers are a doomed race.

For our animals, and more especially valuable stock like race-horses, breeding stations in healthy localities are provided. Surely the offspring of cultured human beings are as valuable, and worthy of as much

care as the descendants of Eclipse, Lexington, and Leamington. Something similar is desirable in the shape of institutions, placed in suitable localities and under proper supervision, where town-born children could be received in tender years and reared. Plenty of exercise in the open air would secure an appetite for simple food, as well as the perfect oxidation of all waste matter; and the child placed under such favorable circumstances would be as free from deterioration as the race-horse. For, though much has been said about the deterioration of the race-horse, it does not appear that any falling off actually exists.

Instead of this, what is done?

When we consider the life of children of the present day in large towns, we become painfully aware of the old adage: "You cannot both eat your cake and have your cake." You cannot wear the child's nervous system out and then expect to have developed from him a sound man, mental and physical.

The town child is provided with innumerable and many very elaborate complex toys in its nursery. It is constantly carried to sights which will please it, and in doing so, excite it. Its little life is a round of gayety, so far as its indulgent parents can manage it. It is taken to the circus, to the pantomime; it has children's parties and balls; it is educated to mimic the life of pleasure. Everything to force its brain is brought to bear upon it.

Early development is not to be desired, and the forced products of town life can no more last well,

than does the race-horse raced long before his period of growth is completed. The promising two-year old, and the quick-witted town child, neither possess much prospect for their later years. The comparatively dull, stupid, heavy country child has a far brighter future before it. It is keeping its cake, not eating it. It is building up a stalwart frame; its brain is comparatively inert, lying dormant; its energies are not expended in a round of excitement and variety; it is slowly developing, not being exhausted prematurely. This is an aspect of the subject which cannot be overlooked in any scheme for the improvement of future generations.

Scrofula was found grown up in town-bred children. Scrofula is but a disease caused by an impaired digestion of albumen, and is in reality a tissue degeneration. Such children, if born of country parents and reared in the country, would have been free from such tissue degeneration.

Oliver Wendell Holmes, in his quaint, pithy way, alludes to this subject in his "Autocrat at the Breakfast Table." He writes: "Men often remind one of pears in their way of coming to maturity. Some are ripe at twenty, and must be made the most of, for their day is soon over. Some come into their perfect condition late, like the autumn kinds, and these last better than the summer fruit; and some like the winter Helis, have been hard and uninviting until all the rest have had their season, get their glow and perfume long after the frost and snow have done their

worst with the orchards." This is exactly the case with the human race. Some ripen prematurely and as soon decay, as, for instance, E. A. Poe. Others ripen slowly, but last longer. Such, for example, are Webster, Clay, and Calhoun. Then some ripen late and retain all their charms far on to the spring-time; of this class we have Longfellow, Whittier, Bryant, Gladstone, and Bismarck.

The child reared in the country has a brisker appetite and a better digestion than the town-bred child. He grows slower, but ultimately attains a larger stature. How far imperfect digestion and assimilation is the cause of this arrested development, either wholly or in part, can scarcely now be apportioned. One thing is certain, however, and this is that girls develop much more rapidly than do boys, but they do not reach the ultimate development of boys. These facts are intimately linked with the matter under discussion, namely, the rearing of town-bred children in the country.

You will say, right here, that affection will render it impossible to send the children away. Well, the English dweller of India has to do it, and there are no evidences that Anglo-Indians are wanting in family affection, only they have learned to subordinate their own feelings to their children's welfare. And the town resident, wherever the Anglo-Saxon has raised his tent-pole over the face of the earth, must learn to do likewise. The ghost of the red Indian flitting around the old burying-places, and dreaming of the

old wigwam standing where a large town now exists, has the sinister consolation of knowing that the white man cannot live on the land he has usurped unless special precautions be taken.

The red man's grave is covered with the white man's buildings, solid, massive, immense; but his first-born die in them. The waning Indian had to vacate his possessions for the white man, that he might increase and multiply on the face of the earth. And now what is the result? The Anglo-Saxon is a dying race, perishing beside the tomb of the red man whom he slew.

Why should this strange fatality seem to hover over the Anglo-Saxon race particularly? The answer is to be found in the fact that the Anglo-Saxons are the most nervous, restless, ambitious, and unsatisfied dwellers on the globe. To this fact they owe their supremacy, and, at the same time, their degeneracy. Something must now be done, or they will sacrifice their first to their second condition.

It is this first element which has enabled old England so long to domineer over the rest of Christendom; while the second threatens to depopulate New England. This fact, so terrible, is nevertheless an undoubted fact, and it seems that the threatened extinction of the old population in Massachusetts is being inaugurated in Ohio.

It is now a rare thing to find a large family of children in New England, and this fact has attracted the attention of those outside of the medical profession,

for it was the subject of consideration in a pastoral letter from one of the Episcopal Bishops of the State of New York to the people of his diocese.

The nutrition of the American-born woman is often unequal to feeding a second being, or if that second being has successfully struggled into an independent existence, it is unequal to its maintenance for long. The specter of the exterminated red man sees Death reaping a rich harvest among the babes and sucklings of his enemy; there are other graves dug alongside those of his ancestors.

The Anglo-Saxon exterminated the native British; there was no compromise; the conquered Briton did not become a hewer of wood and a drawer of water—the slave of his victorious assailant; he perished—died out absolutely. The Anglo-Saxon settled down in the vacant lands, and prospered. For generations this process went on successful and unchecked. Dirt, filth, the disregard of all hygienic laws, the neglect of sanitary laws, the crowding, the narrow tenements; indeed, the necessity for regarding a town as a fortress in the wars of the dark ages, and erecting the houses accordingly, brought plagues in their wake, often exterminating the inhabitants. Now the scene is changed, but not the result. Where the wigwam of the Indian and the wattled hut of the ancient Briton stood amidst primæval groves, we now see the many-storied mill, the long chimney belching forth smoke, the endless row of cottages inhabited by the toilers in the mill. The Angel of Death is still busy.

With the practical turn of his race, the town inhabitant protects himself and his young, so far as lies in his power, brings his water from long distances, constructs elaborate sewerage arrangements, thus copying the wisdom of the old heathen at last. Further, he has appointed a body of medical officers which he chooses to style a "board of health," still more to guard him and his. He has learned that poison germs may lurk in his water, and still more in his milk supply. He has found that the milk-can has spread destruction in his family on numerous occasions in the form of scarlatina; and later he has found that tuberculosis, the most rapid and grave form of consumption is often conveyed in the same manner. He has provided, as far as in his power, against these fluid-borne and contagious diseases which appear so dreadful to look at. But so far he has his eyes shut in regard to another and much more important matter. For one victim to acute contagious disease, *a myriad perish from failure in the digestive processes*. For one infant lying in its last sleep from specific germ-carried disease, a thousand wasted marasmatic pignies are to be found in their graves from improper food and an imperfect digestion.

It is time that some general united effort be made to arrest this slaughter of the innocents, compared to which Herod's massacre was as nothing. Here is a theme for both Church and State to act upon, for the divine, the legislator, and the philanthropist to investigate; and for the physician and the chemist to direct and oversee.

If we can by any means correct this sad falling-off in our own race, we will work a reformation which will shake the entire civilized globe; and which, in comparison, the great reformations of all ages will be as naught.

How shall we set about such a task? It is but for me at this time to make a suggestion. First, we must convince the intelligent masses that the facts which I have set down in the preceding pages are actual truths. To do this, we must proclaim them through the press, that most potent channel in a free government. Then we must announce them from the platform and pulpit, and last and greatest of all, we must teach *them in our schools*, for it is not to be expected that the present generation of fogies will do much toward instituting a revolution; it is from the growing population that we are to expect the advancements. We must instruct our boys and girls about themselves, and it would be well to commence the good work right here; abolish the immense school-houses and overcrowded and badly ventilated school-rooms, which, filled with several times the number of beings which their air can support properly, contain an immense quantity of impurities in the form of organic matters in the expired air. These over-crowded and badly ventilated school-rooms are making their mark on both teacher and scholar. Look at the number of children in our public schools wearing glasses, with lumps in their necks, and with a complexion of almost alabaster whiteness, through which, on their

hands and temples, the blue tortuous veins may be plainly seen. What is the cause of these conditions, so indicative to the careful observer of lowered vitality? The first is to be found in the fact that they do not receive proper oxygen in the air which they inhale to carry on the functions of life. They are crowded during the day, and at night sleep in a little dark, badly ventilated room, which likely enough either contains several other beings, or else communicates with rooms containing others. What will these conditions induce? They will produce just the condition of affairs which I have been trying to describe, namely: a failure of the digestive organs. And to remedy it, we must improve this process and the organs engaged in it.

Hence, when you find that your teeth are beginning to decay, your hair to turn gray and fall out, your mind becomes sluggish, your body to tire more easily; you can at once come to the conclusion that your digestive system is failing, and is warning you that you are becoming prematurely old. If we were to judge the ages of the present population by the condition of their digestive organs, as do the Hindoos, then would we come to the conclusion that we have scores of Methuselahs living in our midst to-day.

APPENDIX.

FOODS SUITABLE FOR THE SICK, THE INVALID, AND
THE CONVALESCENT.

It may not be out of place just here to add a few words of advice as to what foods should be given the sick, and how they should be prepared.

This subject has always been of the greatest interest to me, and during my services as House Physician in Bellevue Hospital, New York, I had ample opportunities afforded me for testing all the food preparations. I did considerable in the way of original experimentation, and succeeded, I think, in establishing some important facts in regard to foods and feeding. This is the first time I have published the results of my work in this connection.

Every one who has had any experience with nursing, knows how difficult it is to find the proper form of food for the bed-ridden sufferer or the convalescent. The different preparations of food which I shall mention are not numerous, but by the exercise of proper judgment in varying them, they will be found adequate for all the requirements of the patient, pleasing his palate, at the same time doing no injury to his general condition. Remember, that it is not the amount of food taken by the sick that does good, but the amount digested and converted into nutritive materials.

Now, to start out, never give to the sufferer, from any acute disease, animal albumen in any form. Avoid all meats, beef-teas, meat essences, eggs, and in many cases it is well to avoid the albumen contained in milk. I will explain further on how this may be accomplished.

TYPHOID FEVER.

In typhoid fever, never give solid food in any form. Stick to liquid diet. Milk, here, is the best food. Never deviate one inch from the above rule, as the safety of the patient depends far more on the successful carrying out of this, than on the medication advised. In typhoid fever the small intestine is covered with ulcers, and if an undigested lump of food should come in contact with one of these, there would be danger of rupture through the walls of the bowel, causing peritonitis, and death must follow as a result.

MILK.

Milk usually can be given pure in almost any disease. But a few directions about preparing it may not be out of place.

Milk often causes trouble by forming too *firm a curd in the stomach*. By adding a little starch to the milk, this can be readily avoided. A little baked *flour* is the best way of giving the starch with milk.

Then, in all cases where a milk diet is required, or where milk is given to the invalid at all, *see that it is taken slowly*, so that it may be thoroughly mixed with the saliva in the mouth.

For infants, when the mother cannot furnish the requisite amount of nutrition, and some other form of food becomes necessary, then give *freshly milked cow's milk* to the child until he reaches the age of two years. Mind, the milk should be taken directly from the cow and given to the child, not allowed to stand ;— for when milk is fresh-drawn from the cow, it is of an alkaline reaction, and in this form it is ready for the infantile digestion. But let it stand a few hours, or even a few minutes, in the summer months, and it undergoes acid changes, and, as such, invariably causes trouble.

When fresh milk cannot be obtained, then give the following : Take good, rich milk, boil and skim ; of this *take one part* and add to *two parts* of barley water, made from prepared barley ; add to this mixture a little salt, and you make a most desirable form of infant food. Or, take *one part solid condensed milk* and *ten parts of barley water*, with a little salt.

Either of the foregoing will be found sufficient to nourish a child, without any other form of food.

When the stomach of the adult is very weak and rejects all articles of diet, then the following may be given to advantage, and will usually be retained : Milk, boiled and skimmed, one part ; barley water, ten parts ; mix and add to this a few drops of dilute muriatic acid. Let cool, and give small quantities at a time until the stomach becomes settled. In some cases it will be found necessary to sit by the patient's bedside and give a teaspoonful of this preparation every few

minutes. I have found this mixture the very best form of food for those suffering from all forms of inflammation of the stomach.

MILK—WINE WHEY.

When it is not desirable to give any albumen, even in the form of milk, then give the following, to which I give the name of *milk-wine whey*: Boil the milk, and when it comes to a boil, add a claret-glassfull of sherry wine; then strain, leaving behind all the *casein*, (the albumen of the milk.) Allow this to cool. Give as the patient may require. May sweeten this if desirable. This is *a most excellent form of food* for the sick under almost any circumstance.

STARCHY FOODS.

Never give any form of starchy food to children before they reach their second year, as up to this time their glands that *secrete the ferment which digests starch are not developed*, and when starchy foods are given, they can only cause trouble such as cramps, vomiting, and diarrhoea. Starches are what cause such havoc among children during the hot months of summer. Hence, in feeding children, never allow them a seat at the family board, for by so doing you cause them to develop false appetites and a sense of dissatisfaction in regard to simple food.

HOW TO PREPARE OAT-MEAL.

Use Hornby's prepared oat-meal; let it soak over

night, then pour the water off, add the requisite *quantity of milk*, and cook in a *farina kettle*. Keep at the boiling point (212°) for only ten minutes, then serve up with rich cream. If you are not charmed with oat-meal so prepared, I will be very much mistaken. Hominy and any of the cracked cereals may be prepared likewise.

STIMULANTS.

Egg-nogg.—When it is desirable to combine food and stimulants at the same time, give the following:

Take white and yolk of egg and beat separately, then take milk, to desired amount, and sweeten with pulverized sugar. To this add *first the yolk* then *the white of the egg*. To the mixture so obtained add the desired amount of liquor, either brandy or whisky. Shake well and keep on ice. Egg-nogg may be kept for several days in this way.

Champagne can be taken when all other form of stimulants is rejected. The boquet of this wine seems to have a peculiar soothing effect on the lining of the stomach.

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